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ABSTRACT

This guide offers planning and organizing ideas for effectively using computers in classrooms that include students both with and without disabilities. The guide addresses: developing lesson plans, introducing the lesson in a way that builds motivation, providing guided and independent practice, extending the learning, and choosing software. Variations in computer availability and use are examined. A sample lesson plan on the U.S. Civil War illustrates use of "TimeLiner" software in a social studies class. The guide concludes with a list of 7 references, 5 print resources, and 13 software programs. (JDD)

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Center for Special Education Technology

Tech Use Guide

Using Computer Technology

ED339158

Planning Computer Lessons

Computers are now in 97% of the schools in the United States. (Quality Education Data, 1990-91). What is being done with them? Are they being used for effective teaching? It's time to focus on effective use of computers in the classroom. This guide will give you some planning and organizing ideas—by addressing lesson plans, available software, and the efficient use of computers.

The students who will be taught these lessons are found in regular education, mainstreamed classes, and resource rooms. Students both with and without disabilities profit from instruction that incorporates the computer as a learning tool.

Lesson Plans

Lesson plans represent decisions that implement learning goals and objectives for the students. Lesson plans specify what the student and teacher will be doing to promote student learning. Computer-assisted lesson plans are no different. Teachers should view technology as a natural, frequently-used medium that contributes to student learning.

First, the teacher should determine the content of a lesson. Analyzing the necessary steps to reach student goals and developing specific objectives, the teacher discovers ways for students to get new information, grasp a new skill, practice it, and make it part of their knowledge. In each phase of the lesson, teachers should consider software and computer use.

Lesson Introduction

Teachers build motivation for the lesson as they focus the attention of students on a topic. The introduction may be a discussion of a term or relevant experiences, a question, or an object that is brought to the students' attention. It can be a link with what was done in a previous lesson.

This may be the time to use manipulatives or firsthand experiences. Students, for example, may experience class survey results by physically standing in line to represent their responses to the survey. Later a graph program on the computer will represent survey results.

Technology can be used in a variety of ways for the lesson introduction. A graph created on the computer can initiate discussion. A video of an event or place, taken by your video camera, can stimulate discussion. Simulation software programs, such as *S.M.A.R.T. Choices* from Tom Snyder Productions, present real-life problems and prompt student discussion. Word processing may record a discussion or points elicited during brainstorming. A printout can be given to students for use during the next phase of the lesson. Teacher's Guides, which several publishers include with their software, give ideas for beginning a lesson.

After the introduction, the lesson often progresses to a whole-class demonstration of the software to be used in the lesson. In this direct instruction, the software either may present the skill to be learned or may be the tool that presents and manipulates new information.

Tutorial software may also be used after an introduction because these programs explain information step by step. Exploration of a software program is another means of learning about a topic.

Guided and Independent Practice

Computers provide step-by-step instruction, and they are always ready to explain again. They provide immediate feedback to students. For these reasons, computers are advantageous for student practice. The guided-practice phase of a lesson involves looking at a problem or skill. Many computer programs provide guidelines for arriving at a solution, as well as examples and nonexamples. For example, with *The Factory* software, students are challenged with making a disk that matches the one on the computer screen. The format for this practice may be individual, small group, or whole group, but it is essential that frequent feedback be given.

After the student understands essential concepts or underlying steps of the lesson, independent practice on the computer can help reinforce skills and understanding. For example, in drill-and-practice math programs, it is assumed the learner understands how to do the math problems.

Extending the Learning

The computer can have a significant role in introducing, reinforcing, supplementing, and extending skills that are being taught. The computer may help with lesson or unit wrap-up, by producing crossword puzzles, word search puzzles, and tests for culminating activities, or with certificates and awards for work completion.

As a closure activity, teachers should discuss what the students learned and how it can make a difference in some

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everyday problem. The teacher needs to help students make the connection to real life.

Choosing Software

The computer, along with good software, may be viewed as one tool and resource in the classroom— like an atlas or a dictionary.

When planning to use computers in a lesson, teachers should take a careful look at what software is available. There may be one piece of software that focuses on exactly what is being studied. For example, the study of geography by an upper-level elementary class may be focused on the world maps and data from *International Inspirer*. Look for additional software that might be appropriate for the learning goals and objectives of your students. The following software and activities could complement a geography study:

Use *Where in the World is Carmen Sandiego®* with worksheets and maps to record countries visited as clues are followed. A database constructed as the program progresses is a helpful reference tool.

Geoworld™ offers experiences exploring the world in search of mineral resources.

Sample Lesson Plan

Subject: Social Studies

Title: Study of the Civil War in the United States

Goals and Objectives for the Lesson:

- To develop an awareness of multiple events surrounding the Civil War period.
- To build collaborative skills for group work.
- To practice research skills by defining a topic and obtaining information about the topic.
- To know how to organize information using a database.
- To understand how historical events relate to each other.

Teacher Decisions:

1. Time required: One hour per day for five days.
2. Student grouping: Students working in assigned groups of four.
3. Supplies needed: Computers with database, word processing, *Time Liner™* software, and a LCD screen, encyclopedias and reference books about the Civil War period.

Prerequisite Student Knowledge:

1. Ongoing study of the Civil War.
2. Efficient database users.

The Lesson

1. Discuss what students know was happening during the time when the Civil War was fought (politics, events, racial climate).
2. Show video *Glory*, which depicts the role of black soldiers in the Civil War. Students, as they view, note issues present in addition to the battle issues.
3. Brainstorm areas where significant events would be taking place during the Civil War period. Use word processing on the computer and a large screen to project the areas. For example, inventions, literature, art, music, politics.
4. The assignment: Divide the class into groups of four. Each group is to:
   a. Decide on a research topic about the Civil War.
   b. Perform the research and enter the information into the database.
   c. Write a question to ask the class that can be answered by looking up information in the database.
5. Review use of the database, the fields present in the program, and how to enter new information. (The fields might be topic, historical event, who, when, and where.)
6. Present skill of discussing and coming to consensus in a group; model building on the ideas of others and compromising.
7. Groups discuss, research and enter their information in the database.
8. With the entire class together, groups use the database to find answers to the questions asked by other groups.
9. As a class, use *TimeLiner™* software to construct a time line of events that were occuring during the Civil War period.
10. As a class, discuss the information. For example, ask students to: Contrast two events that were going on during the same time period and analyze the effect one event might have on another event.
11. Have the group reflect and comment on how the process of getting the information worked in their group. Note problems that could be alleviated next time by doing things differently.

Crosscountry USA® sees the world through the eyes of a truck driver.

Mousepaint™, or another graphics program, gives students the opportunity to draw maps with legends.

Using *Ten Clues*, students can identify a geographical area after reading the clues.

Word processing and database programs are useful for writing reports and organizing information about places being discussed.

Likewise, in a vocabulary study by a junior high class, a word processing program might be the centerpiece. But other software can contribute to this study:

- Using *Crossword Magic*®, students can create crossword puzzles with new vocabulary words.
- With *Word Attack*®, students study vocabulary with teacher-customized word lists.
- *MousePaint*™, or other graphics software, can be used to draw visual representations of new vocabulary words; and other students can then guess the words in a pictionary-type activity.
- A *spreadsheet* can be used for listing prefixes or suffixes along with words that include the prefix or suffix.
- With *Create with Garfield*, students select a new vocabulary word and use it to create a cartoon.

These examples show creative uses of software with different subject areas. Whatever the topic, be creative with the applications for the software in your library—and don't feel limited to catalog descriptions.

If you have the opportunity to purchase software, look first at your curriculum, and then at the software catalogs. Consider the quality of the content, clear graphic design, ease of use, and available teacher options. Look for publications that evaluate educational software, such as the book *Only the Best*. Software databases supply lists of available software from the key words you select.

Computer Availability and Use

Your approach to computer-assisted lessons depends on how many computers you have in your classroom, whether you go to a lab to work on the computers, or whether you have one copy of a software program or a lab pack of many copies. Let's examine some variations in computer availability and use.

When one computer is available in the classroom, students can work individually at the computer, often writing using the word processor, and exploring problem-solving programs. In addition, students can develop keyboarding skills or work individually on drill-and-practice programs. Students can be given a specified period of time as their "computer time." A database with the date, time, student, and assignment can be created and printed to keep track of student computer time. When more than one computer is available in a classroom, several students can work on individual computers at the same time.

Directions may be kept at the computer, along with the designated software. The word processor can be used to create the directions either on a disk or on paper. A student who knows the program may teach it to peers; or the teacher may give directions to the whole class, using a large screen projection device such as an LCD (liquid crystal display). Several large monitors may be necessary to allow all students to view the computer monitor. Simulation and problem-solving programs present the class with planning, decisions, and calculations.

Another effective way to organize computer assignments is to have students interact in groups of two to five members. These groups can work at one computer by rotation, or groups can work simultaneously if many computers are available in the classroom. Cooperative learning methods, including common goals and collaborative skill development, assist group work. Everyone needs a chance to be the keyboarder, and everyone needs to encourage all members to contribute to the activity. Group analysis of the process, as well as review of content, is essential.

Classes may be scheduled to work in a computer lab with a computer teacher. During this time, the regular classroom teacher may find out about new computer programs that the lab teacher presents. Communication between the teachers informs each of them of the computer lab content and the regular classroom study allowing them the advantage of building on each other's work. In the computer lab, consider whole-group, small-group, and individual activities while planning use of scheduled time.

Limited availability of software also requires creative approaches. What can be done when several computers are available but only one copy of the software program is available? Computers may be booted up with different software programs at each computer station. Worksheets at each station help students keep track of each task and record its completion. Task cards can clarify directions—including how to turn the computer on and off and where to get help. If you have only one computer in your classroom, the computer station can become a separate learning center. As with other learning centers or workstations in the classroom, you should establish routines, so that students know where to go to get started, where the software will be, and what to do with it at the end of the lesson.

Each computer configuration and student grouping has its own advantages. Use the computers available to you and decide on individual, small-group, and whole-class work to support your teaching. When making choices for instruction, consider goals, content, student groupings, and the software and computers available to you. As an experienced teacher you have the background for teaching lessons with computers. You don't need to be a computer expert, but familiarity with the hardware and the software will illuminate more opportunities for

learning. Soon they will be an integral part of your teaching; and you will be saying, "I can't teach without computers!"

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Software

Create with Garfield, Apple, Commodore, IBM. DLM Teaching Resources, One DLM Park, Allen, TX 75002; 800/527-4748.

Crosscountry USA®, Apple, Didatech Software, 3812 William St., Burnaby, BC V5C 3H9, Canada. 604/299-4435.

Crossword Magic®, Apple, IBM, Macintosh. Mindscape, 3444 Dundee Rd., Northbrook, IL 60062; 800/999-2242.

The Factory, Apple, Commodore, IBM, Tandy. Wings for Learning, 1600 Green Hills Rd., P.O. Box 660002, Scotts Valley, CA 95067-0002; 800/321-7511.

Geoworld™, Apple II. Tom Snyder Software, 90 Sherman St., Cambridge, MA 02140; 800/342-0236.

MousePaint™, Apple. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 800/776-2333.

National Inspirer™, Apple II, IBM. Tom Snyder Software, see *Geoworld.*

S.M.A.R.T. Choices™, Apple, IBM. Tom Snyder Software, see *Geoworld.*

The Teacher's Tool Kit®, Apple, IBM. Hi Tech, 202 Santa Cruz, CA 95060; 408/425-5654.

Ten Clues, Apple, IBM. Sunburst Communications, 101 Castleton St., Pleasantville, NY 10570; 800/628-8897.

TimeLiner, Apple II, IBM, Macintosh. Tom Snyder Software, see *GeoWorld.*

Where in the World is Carmen Sandiego?®, Amiga, Apple II, Commodore, IBM, Macintosh. Broderbund, 17 Paul Dr., San Rafael, CA 94903; 800/521-6263.

Word Attack®, Apple, IBM, Macintosh. Davidson & Assoc., 3135 Kashiwa St., Torrance, CA 90505; 800/556-6141.

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